in the valves, heart muscle, or arteries, there comes a time when the heart has used up its reserve force and begins to dilate. There occurs a train of symptoms indicative of a decrease of the force behind the circulation. When such changes occur from a primary disease of the heart, they not infrequently develop gradually, while when due to kidney inefficiency resulting in a retention of some toxic material which likely causes a sudden vascular spasm, too much work is suddenly thrown upon the heart, and a rapid dilatation ensues before the organ can adapt itself to the new demand. In such cases, in order to bring about a restoration of the heart action there are two alternatives: either to lessen the amount of work the heart has to do, or, by judicious stimulation, to increase the functional activity of the organ to such an extent that it can meet the new call that has been made upon it and properly perform its function.

It is not the purpose of this paper to discuss the various remedies which may be used to bring about this restoration of the circulation. In the large number of cases of embarrassed heart action which develop more or less suddenly from acute Bright's disease and during the course of chronic Bright's disease, the nitrites should be of distinct value as therapeutic agents. Their primary and most marked effect is to dilate the smaller arteries and veins, lower the blood pressure, and remove some of the resistance offered to the overworked heart. The work of the heart is temporarily lessened. If their action stopped here, or if they depressed the already embarrassed heart muscle, their use would undoubtedly do harm. But if at the same time the work of the heart is lessened, and if the systole is increased and the diastole lessened, no harmful influence, but a beneficial one, could come from their use in such emergencies.

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OTITIS MEDIA AND ITS TREATMENT.

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THE general practitioner is familiar to some extent with most of the so-called specialties, and feels that he is competent to care for properly patients with minor gynecological, surgical, or nose and throat affections; but diseases of the eye and ear are usually neglected by him. It is true that the field of the general practitioner is very large, and he must draw the line somewhere as to what he will undertake if he expects to have more than a nodding acquaintance with that part of the work which he does consider within his province. In his daily life he soon finds that some special preparation and equipment along several lines is very necessary, and we find among the general practitioners competent clinical microscopists, expert physical diagnosticians, adepts in pelvic diagnosis, and so on; but how rarely one sees a general practitioner who can manipulate a head mirror so as even to direct the ray of light into an ear, much less to see and understand what he sees there. Yet it is likely that in the average practice affections of the ear of greater or less importance are quite common, much more so, for instance, than cases of appendicitis, or enlarged prostate, or diphtheria, and it must follow that just in that proportion the proper understanding of those ear conditions and the ability to recognize and treat them is important to the to the general physician. The possible serious consequences of the diseases I have cited command for them much respect, and in this particular they may be judged to be ill chosen, but I venture the assertion that more present and future suffering and unhappiness, and, looking far to the future, more lives, will be saved by the practitioner who properly recognizes and cares for his acute ear cases than by one who recognizes early and treats properly his cases of appendicitis.

To learn to use the head mirror and ear speculum so that the ear drum can be seen is a matter of a little practice, and not half so difficult as many of the things demanded of us in auscultation, pelvic diagnosis, certain surgical procedures, etc. The method is fully described in text books, and I need only mention the abundant opportunity which every physician has of practising it. With office patients especially, who can be brought to the light, one additional minute will serve for an inspection of the ears; and without the patient thinking anything but that he is being carefully examined, one can soon acquire dexterity in the manipulations, ability to see into all sorts of ears, and a thorough familiarity with the normal drum. To those in large cities, where special clinics abound, the problem is even simpler.

When undertaking to examine the ear, the light is of great, if not first, importance. In my experience the best light is that from the fiber mantel of the Welsbach and similar gas lights. These are now adapted to lamps, and are very good for office work. Good daylight is satisfactory, but so variable as to be impracticable. The most convenient light is the electric; as a cord and lamp can be carried in one's satchel and used at the bedside, where most of the examinations will be made. The best electric lamp is the so-called ophthalmological lamp, with a spiral filament so arranged as to give a very brilliant disk of light. If this is not to be had, a frosted bulb should be used, as the clear glass lamp of the ordinary type gives confusing lines of light across the field. If electricity is not available, an oil lamp with a large flat flame, turned with the flat side toward the examiner, is satisfactory for bedside work. Without sufficient light, good work is impossible.

The best head mirror is one of about eight-inch focus. Head mirrors, as usually made, have a much longer focus than this, and as one must be close to the ear to see well, the field to be inspected is not at the point of greatest illumination, as it is with a mirror of eight-inch focus. Mirrors are now to be had with large openings, 1.5 to 2 cm. in diameter, and these are easier to use than those with the small hole 1 cm. or less in diameter. One must look through the hole, as the line of sight and the line of light must coincide to enable one to see the bottom of the canal.

With adults, the patient can be put in any position the examiner wishes. Children should be held in the following manner: To examine the right ear, seat the child sideways on the nurse's lap, with its left side against the nurse's body. Pass the child's left arm around the nurse's body under her right arm. The nurse's right hand grasps the child's right hand and right thigh, holding both firmly, with the thigh flexed on the body. The nurse's left hand is pressed on the child's right parietal region above the ear, and the head is pressed firmly against the nurse's body. While this is probably not quite so good as wrapping the child in a sheet, yet, with someone to hold the child who has a moderate endowment of physical strength, it answers the purpose very well and much better than any other method that I have tried of holding a child. It is necessary to admonish the nurse to "hold the child firmly till I am through," as the tendency is to turn the little one loose when the examiner's attention is momentarily directed from the ear, when the whole performance of getting everybody in position has to be gone over again, a thing wearing on the patience and tempers of all concerned.

The examination of the ear of a little child is not easy. To begin with, the smallest speculum of the sets as usually supplied is too large, and this should be borne in mind in buying a set. The already small canal is often encroached upon by deposits of cerumen and flakes of epithelium on the walls of the canal, and these tend to be scraped up by the end of the speculum, and obstruct the view. Patient use of the syringe and applicator are necessary, and while the latter may be a little less gentle, it is, in my experience, more satisfactory to wipe the ear with a little cotton twisted on the applicator and wet, than to try to cleanse it with a syringe. This applies to the accumulations of epithelium and cerumen, rather than to purulent discharges, which are thin and more easily disposed of.

WHEN TO EXAMINE THE EARS. Knowing how to do it understandingly, and having passed the stage when we are still looking at all the ears we can to become familiar with the manipulation, when should a physician feel called upon to examine the ears of a patient—

leaving out of consideration the very obvious cases when the patient complains of a pain in the ear.[1] I should say that it should be done, as a routine measure in children, daily, or at least frequently, in measles, whooping-cough, chickenpox, pneumonia, and acute bronchitis. In scarlet fever, and febrile conditions of obscure and not readily explained origin, the ears should be examined daily. In the scarlet fever cases, the rapidity of the destructive process and the serious effect on the hearing, with the great tendency to chronic suppuration and possible ultimate operation for its cure, demand that these cases be recognized and treated early, in the hope of obviating or ameliorating their serious consequences. A sudden rise of temperature in scarlet fever is often of otitic origin, and suppuration may occur without complaint on the part of the patient of pain in the ear.

In fevers of obscure origin, which the general practitioner has seen many more times than I, the riddle is often suddenly solved by the appearance of a discharge from the ear. How much more creditable it is to achieve the diagnosis than to have it thrust upon us.

In this connection attention has been frequently called to the manner in which acute middle-ear inflammation, especially in children, can simulate serious meningeal and gastro-intestinal disturbance. The reason is not hard to see, for the elevation of temperature causes the restlessness and cerebral and motor disturbances of the ear disorder to simulate more or less a meningeal irritation, especially when associated with pain in the head. In the other case, the disturbance is again through the medium of the temperature, which has suddenly and completely stopped gastric and intestinal secretion and the digestive processes dependent on them. Decomposition and fermentation are followed by auto-intoxication, which may so complicate the clinical picture that it looks like almost anything else rather than an acute otitis. In such a case routine methods only will save us from disaster.

WHAT IS SEEN. Having cleansed the ear, and finally brought the the drum into view, we will see one of four things: (1) A normal drum, of uniform mother of pearl color; (2) a reddened drum, which may be more reddened in its upper part and along the handle of the malleus; (3) a red and bulging drum, which may vary from a slight fulness to a pronounced blister-like surface; or (4) a perforated drum, in which case pus or other secretion can usually be seen to exude from one spot on the drum, unless the drum is wholly or partially destroyed.

WHAT TO DO. Having determined to examine the ears, and having found some one of the conditions mentioned above, what must be done? If the ear drum is normal, nothing is to be done. J. F. McKernon, of New York, a few years ago spoke of the danger of mistaking a drum covered by a flake of epithelium, desquamated or ready to be desquamated, for a normal drum. Such a drum would have no lustre, and a little wiping will dislodge the dead tissue and disclose the true state of affairs.

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[1] This suggests the propriety of examining the ears of patients who are unconscious from any not easily recognized cause, since a hint may be obtained as to the presence of some infectious intracranial trouble of otitic origin.

If the drum is simply red, still not much is to be done in the way of active treatment; inspection of the nose and throat, renewed care of the skin and the secretions, protection from cold, and possibly inflation with the Politzer bag would be in order, and if any pain is complained of, a warm application to the ear is grateful. This may vary from a shawl or warm flannel pad to a hot water bag.

If the drum is red and bulging, we have then to deal with a fully developed otitis media with exudation. At this time we cannot tell whether the exudation is purulent or not, and I think we get in the habit of proceeding on the supposition, or at least the hope, that it is not. With this condition present there is more general disturbance, and, conversely, in seeking the cause of a considerable general disturbance, such as high temperature, cerebral irritation, etc., such an ear could be justly regarded as the cause of the symptoms, and the treatment would be governed to a considerable extent by the severity of the symptoms. If these are moderate in severity, with the fever not alarmingly high and not much complaint or evidence of pain, and no cerebral or gastro-intestinal irritation, then we may temporize. The nose and throat should be looked to, and such treatment applied to them as seems proper. But let me say that very often we can do very little in this direction, except a warm alkaline wash, either sprayed into the nose, or instilled from a teaspoon or medicine dropper. More active treatment is difficult to apply, and, on account of the traumatism attending its use, might do more harm than good. I refer especially to the application of astringents to the nose and nasopharynx. The bowels should be opened, preferably with calomel, the skin and kidneys seen to be properly functionating, and the child protected from exposure. To the ear we can apply heat in some convenient form. A hot brick, hot water bottle, electric lamp, hot salt bag, etc., suggest themselves as forms of dry heat, which had better be applied continuously. Moist heat is applied by flowing water from a fountain syringe into the ear. The technique must be carefully explained to the nurse. The bag should be hung or held a foot or two above the patient's ear, since there is nothing to wash out and all that is necessary is to get a flow of water into the ear. The water should be as hot as can be borne on the forearm, that is about 110° to 115° F., and at least two quarts should be used at a time. The tip of the nozzle or tube, of course, should not obstruct the meatus. Many of us recall Dr. Wm. Goodell's illustration of the washerwoman's fingers as illustrating the difference between the effects of short and long hot douching, and that point is to be applied here, as we want the constringing effect of the hot water. After finishing the douche, the ear should be dried and a warm or hot application made externally.

Drops are much used, and, undoubtedly, often relieve pain, and this is as far ahead as the lay woman looks. The most commonly used is a mixture of laudanum and olive oil. It is objected to as being dirty, but will probably continue to be used, and I cannot say that I have ever seen any ill effects from its use. I much prefer a warm 10 per cent. carbolized glycerin, which will do all that any solution will do, and is a protection from, rather than a cause of, infection in case of a rupture of the drum.

I have been often impressed with what strikes me as the happy effect of a single full dose of opium in this condition. I do not wish to be understood to say that children with earache are to be drugged into insensibility, but one full dose of opium often quiets symptoms, and during the lull the process subsides and is not the cause of further trouble. I am sure that the physiological action of opium is such as to make such a thing possible, if not likely.

It is well for our reputation as prophets that we should warn the parent, when the least bulging is present, that the drum may rupture and the ear discharge at any time; the alleviation of subjective symptoms gives no assurance that this will not occur.

If these measures fail to relieve the situation in twelve hours, or if the symptoms are of considerable severity when the condition of the ear is first discovered, I think we should not temporize, but at once incise the drum. While no surgical procedure is free from the possibility of unpleasant surprises, this one is practically so and fully justified by experience. The laity is accustomed to it now, but if one encounters an anxious mother who fears the effect on the hearing, she can be reminded that we only anticipate nature, and do no more harm than a spontaneous rupture would do. The drum should be incised freely in the posterior inferior quadrant, under antiseptic precautions and the best possible illumination. The drum is of the thickness of paper, and the knife need not enter deeply.

Local or general anesthesia may be used. Until one has gained confidence in the little operation, general anesthesia is preferable, as it is not always easy to tell which is drum and which is canal wall, and incision of the latter under local anesthesia is very painful. Under general anesthesia the two can be distinguished with a probe. Local anesthesia of the drum is very satisfactorily produced by means of a mixture of equal parts of cocaïn, menthol, and carbolic acid. These substances together form a liquid, which should be applied to the drum under good illumination, by means of a very small wisp of cotton on an applicator. I have often incised the drum by this method without the patient feeling it.

The incision, as a rule, is followed by a free discharge of serous fluid. It is well to keep a little sterile cotton in the canal and change it frequently, but not attempt anything in the way of cleansing unless the discharge becomes thick, when it may be removed by syringing with boric acid solution. If this is done, I think care should be used to dry the ear afterward with the cotton on an applicator. By packing of the canal with gauze following the incision of the drum, it is claimed that the discharge remains serous until it ceases, and that the mucopurulent character which it otherwise assumes is an evidence of infection. If this should prove to be so, then the canal should certainly be kept filled with the sterile gauze drain.

Attention should be especially directed to one phase of general disturbance which is of serious significance. With evidences of otitis media, there are sometimes seen sudden elevations of temperature to 104°, 105°, or 106°, with a sudden drop, and during the period of normal temperature the child is apparently perfectly well. The temperature will rise again after a few hours, or in a day or more. Dr. McKernon has called attention to this phenomenon as indicative of primary thrombosis of the jugular bulb, a serious condition, necessitating a serous operation.

If on the first examination a discharge is discovered coming from the ear, it should be treated as was suggested in speaking of the treatment of the ear after an incision of the drum. If symptoms arise indicating the presence of complications, such as mastoid pain and tenderness, irregular elevations of temperature with a sudden drop, or a persistence of the pains or temperature after the ear has begun to discharge, I think it is the duty of the general practitioner to have the opinion of an otologist.

The following brief notes of a few cases are suggestive:

CASE I.—*Acute Otitis Media Causing Symptoms Resembling a Gastro-intestinal Disturbance.*

A little girl, aged nine months, and previously healthy, was taken sick with high temperature (103° to 104°) and constipation. In about twelve hours abdominal distention was noted, with tympany. The bowels were moved by an active cathartic, the discharges being very foul smelling. No diagnosis was made until the left ear began to discharge, when the temperature at once subsided and the abdominal symptoms rapidly disappeared. I did not see the child until the ear had begun to discharge, and the diagnosis was "thrust upon us."

CASE II.—*Otitis Media Occurring in the Course of Acute Bronchitis and Causing Symptoms of Cerebral Irritation.*

I was asked to see infant G., aged six months, who had a mild acute bronchitis. The temperature had been about 100°, but suddenly rose to 102°, and the child became extremely restless, throwing the head back and tossing it from side to side. There was a demonstrable nuchal stiffness, the pupils were moderately dilated, and the eye grounds were normal. The left ear drum was found red and bulging, and paracentesis allowed the escape of a considerable quantity of serum, stained with blood at first from the incision of the drum. The temperature at once dropped to 99° and the child slept quietly nearly all night. The subsequent course of the otitis and the bronchitis was uneventful.

CASE III.—*Otitis Media Complicating a Severe Bronchitis.*

The patient was a little girl, aged five years. She had a severe bronchitis with a temperature of 102° to 103°, but the physical signs in the chest and the temperature indicated subsidence of the bronchitis. Suddenly the temperature rose to 103° or 104°, with distinct complaint of pain all over the head. A bilateral otitis with bulging drums justified double paracentesis, which was done under local anesthesia with the cocaine-menthol-carbolic-acid mixture. A free discharge of serum, becoming later mucopurulent, occurred, with subsidence of the temperature. The child was unable to locate the pain as situated in the ears. There was later a further development of the bronchitis, with fresh exacerbation of temperature, explained by the physical signs in the chest and apparently not due to the ears. Drainage of the ears was sufficient and ultimate recovery perfect.

CASE IV.—*High Temperature, Without Apparent Cause, Due to Otitis Media.*

This patient was an infant, who suddenly developed a temperature of 103°, without apparent cause. The restlessness was very marked, and in the course of a routine examination one ear was found inflamed, with a red and bulging drum. Paracentesis allowed a free serous discharge, with prompt relief of all the symptoms.

This case in my experience is a common type, and other similar ones could be quoted.

I well remember Dr. Agnew beginning his closing lecture at the University of Pennsylvania by saying that there were two operations every medical man should be able to do, tracheotomy and the operation for strangulated hernia. May I suggest the addition of paracentesis of the membrana tympani?